6-1 Graphing Systems of Equations

What You'll Learn

Scan the text under the *Now* heading. List two things you will learn about in the lesson.

1. Name and classify systems
2. Solve systems by graphing

Work on this for the next couple of minutes. I will call on one of you afterward.

Active Vocabulary

Review Vocabulary Make a table of values which satisfy the equation $x + y = 13$. *(Lesson 3-1)*

$y = -x + 13$

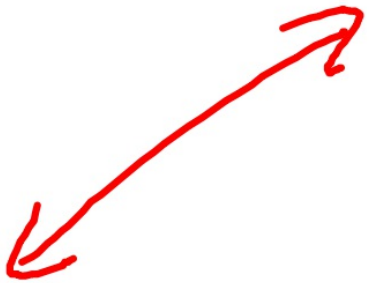
x	0	1	3	10	...				
y	13	12	10	3					

Is it possible to make a table that shows all ordered pairs that satisfy this equation? Justify your answer.

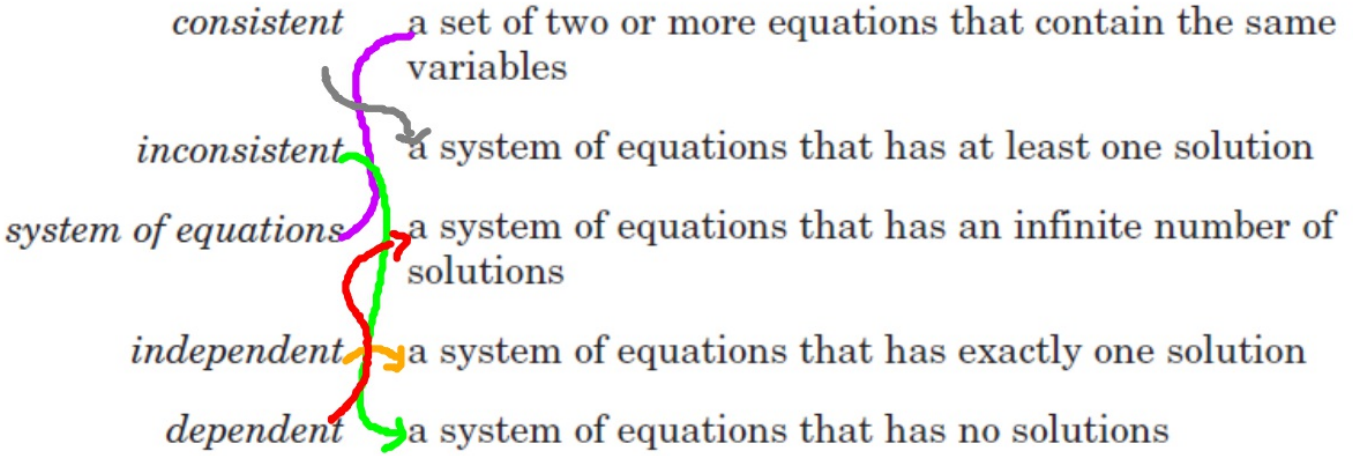
No ... Infinite

How can you show all of the ordered pairs for the equation?

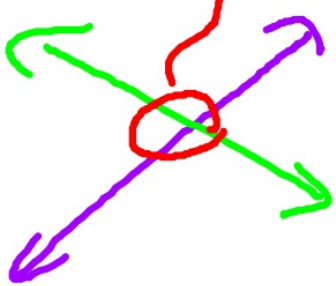
with a picture!

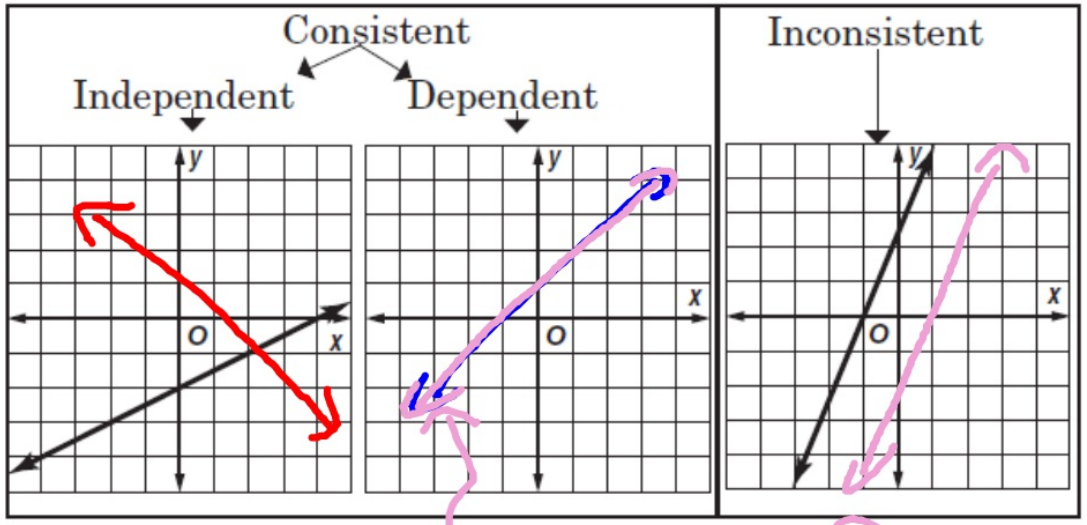


New Vocabulary Match the term with its definition by drawing a line.



Main Idea	Details
Possible Number of Solutions	**Add a line to each graph so that the given condition is satisfied.**





Solve by Graphing

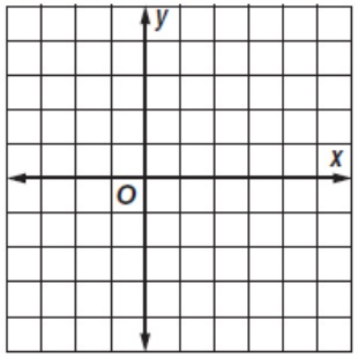
Solve the system of equations by graphing.

Step 1
Solve for y in each equation.

$2x + y = 9$

$2x - 5y = 15$

Step 2 Graph each equation.



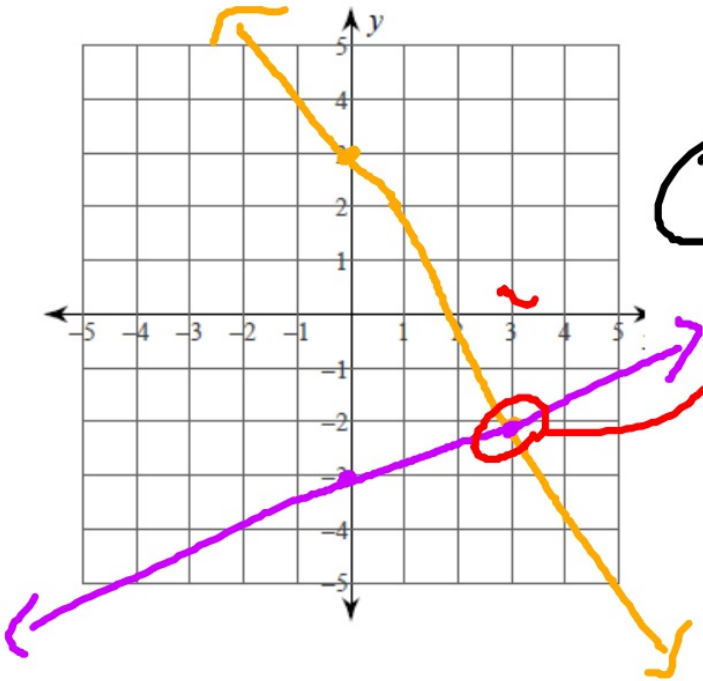
Step 3 Find the solution.
The lines intersect at point _____.

Solve each system by graphing.

$y = mx + b$

1) $y = -\frac{5}{3}x + 3$

$y = \frac{1}{3}x - 3$



① Graph each equation.

② Find the point of intersection.

③ check it!

(3, -2)

$-2 = \frac{-5}{3}(3) + 3$

$-2 = -5 + 3$ ✓

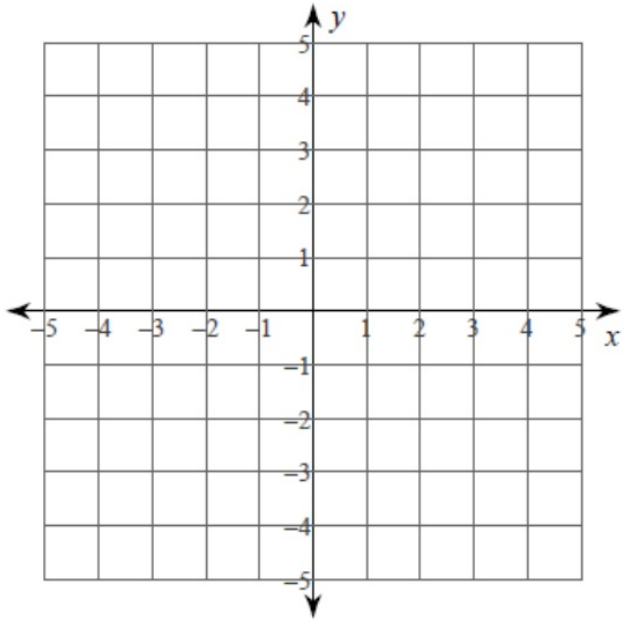
$-2 = \frac{1}{3}(3) - 3$

$-2 = 1 - 3$ ✓

Solve each system by graphing.

2) $y = 4x + 3$

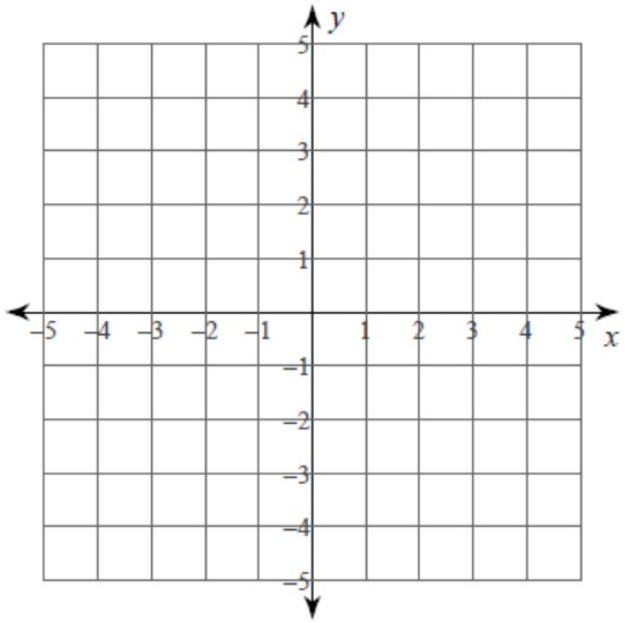
$y = -x - 2$

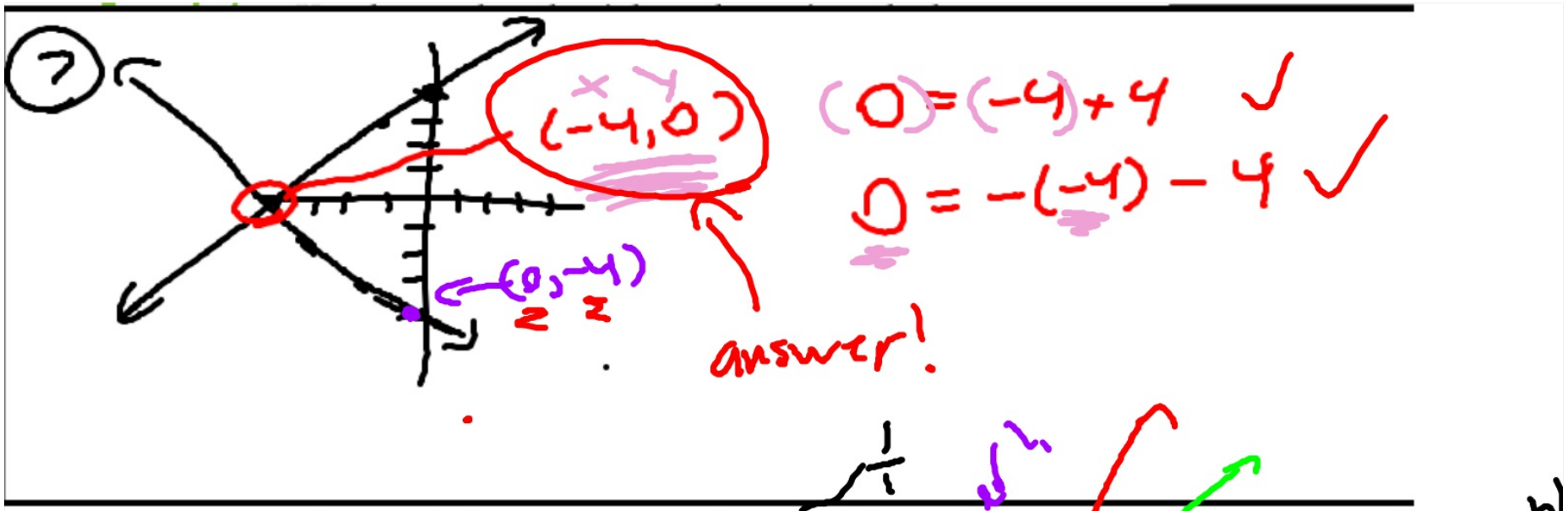


Solve each system by graphing.

4) $y = -1$

$y = -\frac{5}{2}x + 4$



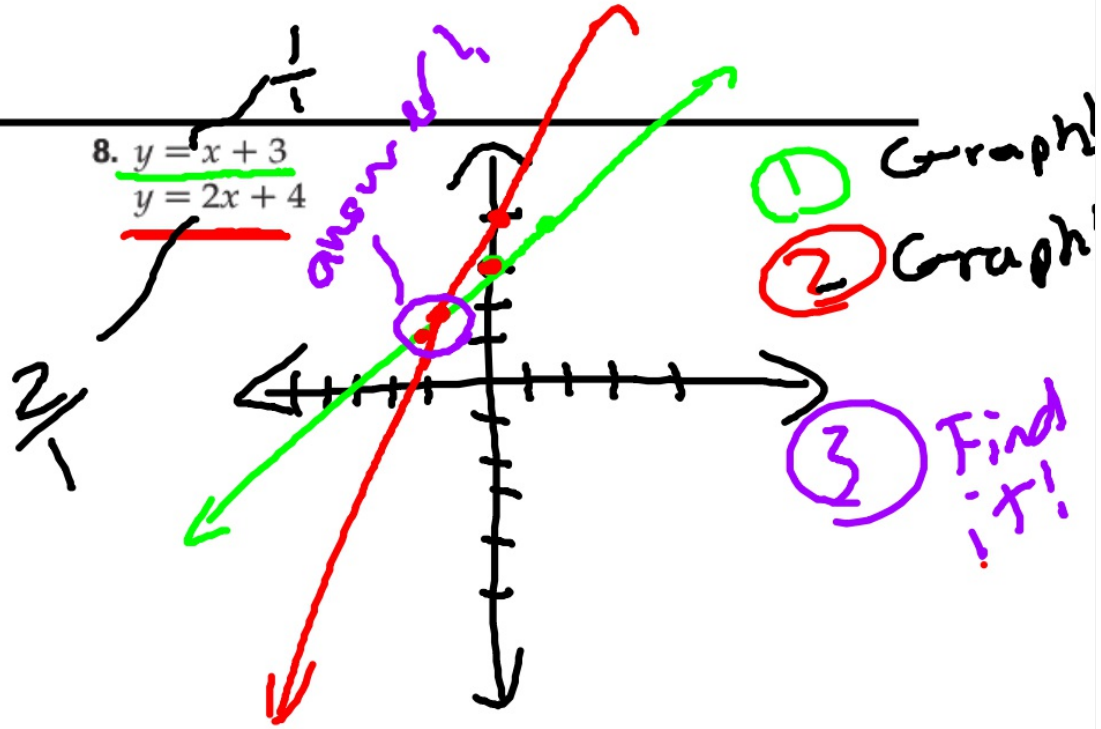


7. $y = x + 4$
$y = -x - 4$

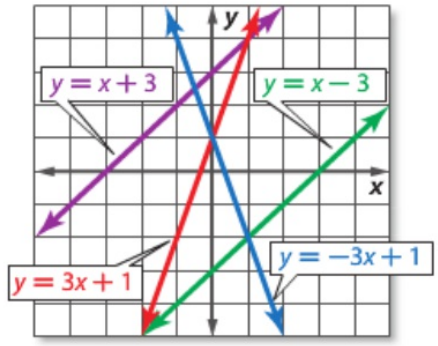
$-4 = 0 + 4$

$0 = 0 - 4$

$-4 = 0 - 4$



Example 1 Use the graph at the right to determine whether each system is *consistent* or *inconsistent* and if it is *independent* or *dependent*.



1. $y = -3x + 1$
   $y = 3x + 1$ **consistent and independent**

2. $y = 3x + 1$ **consistent and independent**
   $y = x - 3$

3. $y = x - 3$
   $y = x + 3$ **inconsistent**

4. $y = x + 3$ **consistent and dependent**
   $x - y = -3$

5. $x - y = -3$ **consistent and independent**
   $y = -3x + 1$

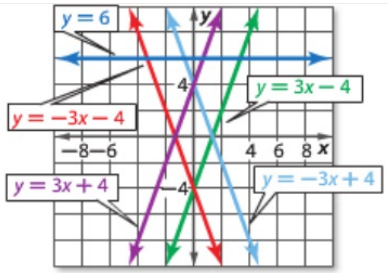
6. $y = -3x + 1$ **consistent and independent**
   $y = x - 3$

Example 2 Graph each system and determine the number of solutions that it has. If it has one solution, name it. **7–8. See margin.**

7. $y = x + 4$

8. $y = x + 3$

Example 1 Use the graph at the right to determine whether each system is *consistent* or *inconsistent* and if it is *independent* or *dependent*.



10. $y = 6$
$y = 3x + 4$

11. $y = 3x + 4$
$y = -3x + 4$

12. $y = -3x + 4$
$y = -3x - 4$

13 $y = -3x - 4$
$y = 3x - 4$

14. $3x - y = -4$
$y = 3x + 4$

15. $3x - y = 4$
$3x + y = 4$

$y = mx + b$

Example 2 Graph each system and determine the number of solutions that it has. If it has one solution, name it. **16–24. See margin.**

16. $y = -3$
$y = x - 3$

17. $y = 4x + 2$
$y = -2x - 3$

18. $y = x - 6$
$y = x + 2$

19. $x + y = 4$
$3x + 3y = 12$

20. $x - y = -2$
$-x + y = 2$

21. $x + 2y = 3$
$x = 5$

22. $2x + 3y = 12$
$2x - y = 4$

23. $2x + y = -4$
$y = -2$

24. $2x + 2y = 6$
$5y + 5x = 15$

10. consistent and independent
11. consistent and independent
12. inconsistent
13. consistent and independent
14. consistent and dependent
15. consistent and independent

(20) $x - y = -2$
$-x + y = 2$
$-x \quad -x$
$-y = -x - 2$
$-1 \quad -1$
$y = x + 2$

$-x + y = 2$
$+x \quad +x$
$y = x + 2$

consistent + dependent.

21. $x + 2y = 3$

$x = 5$

so....

$5 + 2y = 3$

$-5 \quad -5$

$2y = -2$

$\frac{2y}{2} = \frac{-2}{2}$

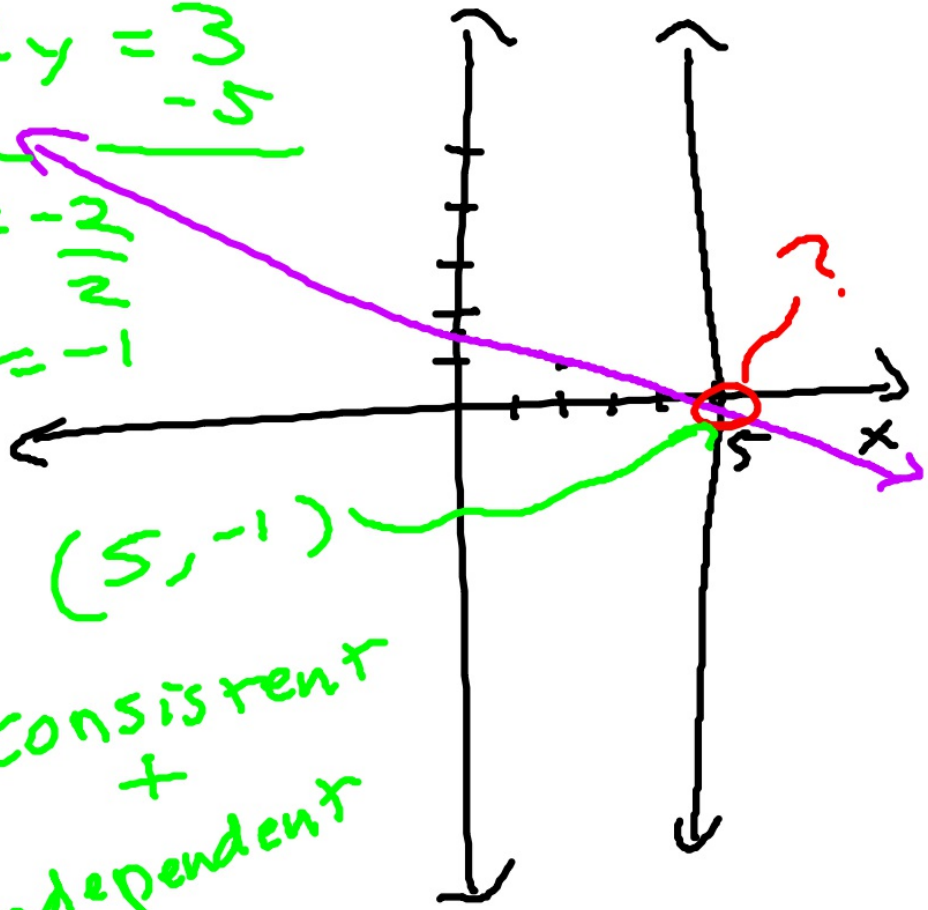
$y = -1$

$x + 2y = 3$

$-x \quad -x$

$\frac{2y}{2} = \frac{-x + 3}{2}$

$y = \frac{-1}{2}x + \frac{3}{2}$



(5, -1)

consistent + independent